Probability: Exercise 1

Investigating pattern of probability for rolling two dice

(6 Hope)

Stage 1

Finish the given worksheet to find out the sample space (using tables) and find theoretical probability of different events (Q1 and Q2). Then do the experiment to find out experiemtal outcomes and compare with your expectation.

Chance and probability – using tables

When we work out all the possible outcomes of an event that could happen, we are finding out the theoretical probability. When we do the experiment and look at the probability of what actually happened, we call it experimental probability.

Theoretical probability is:

$$\frac{\text{number of favourable outcomes}}{\text{total number of possible outcomes}}$$

Experimental probability is:

$$\frac{\text{number of times the event occurred}}{\text{total number of trials}}$$

1 **When we roll 2 dice together, we can get a number of totals. Fill in this table to show the possible outcomes when 2 regular dice are rolled and added together:**

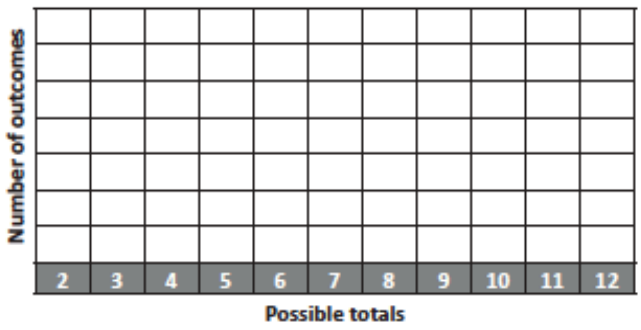
Die 2 \ Die 1	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

a How many different ways can the dice be rolled? ☐

b Which total occurred the most often? Shade this in the grid.

c Which totals occurred the least often? Circle these on the grid.

2 **Graph the outcomes from the table above in the grid below.**
Express the theoretical probability of the following as a fraction:



a 7 = ☐/☐ b 9 = ☐/☐

c 2 = ☐/☐ d 10 = ☐/☐

3 **Now try this experiment. You will work with a partner and roll 2 dice 36 times. First make your predictions as to how often you will roll each answer. Write this in the first row. This is the _____ probability. Now actually roll two die 36 times. In the bottom row, tally the number of times each total appears. This is the _____ probability.**

Total	2	3	4	5	6	7	8	9	10	11	12
Number of times you expect to see each total											
Number of times you actually get each total											

Stage 2

Finding probability of different sum by tossing two dice.

Sum of two dice	Expected number of the event occurred (in theory)	Theoretical probability $=\frac{favourable\ outcomes}{all\ possible\ outcomes}$	Actual number of the event occurred (from experiment of my own /group)	Experimental probability $=\frac{no\ of\ times\ the\ event\ occurred}{total\ number\ of\ trial}$	Actual number of the event occurred of the whole class (adding the result of all groups from my class)	Experimental probability
2	1	1/36=0.028			12	
3					8	
4					19	
5					20	
6					25	
7					45	
8					33	
9					23	
10					17	
11					8	
12					6	
Total:	36	1	36	1	216	1

Stage 3

Find, describe, verify and justify the pattern you have found in the theoretical probability and experimental probability at stage 1 and stage 2.